

THE PORT AUTHORITY
OF NEW YORK AND NEW JERSEY

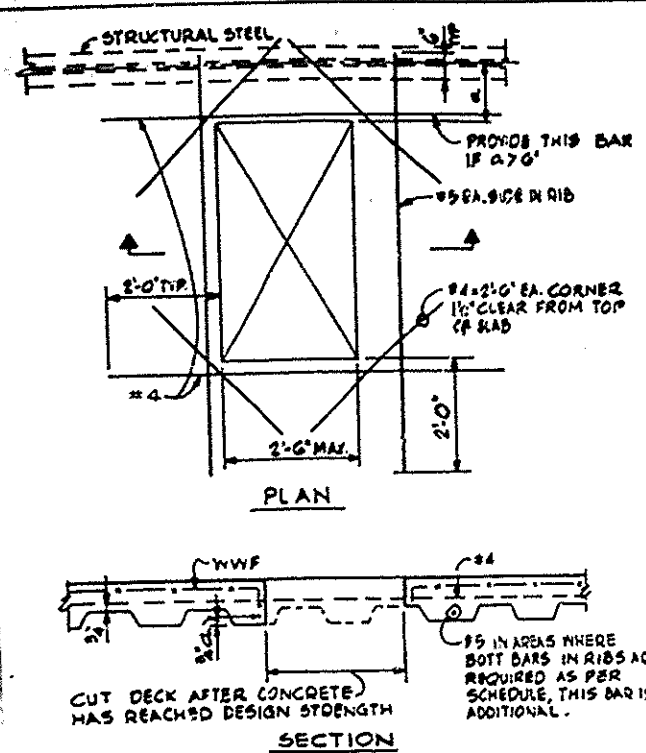
 CONFORMED DRAWING
02/03/98
SIGNED AND SEALED
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 ORIGINAL SIGNED & SEALED BY
N.Y. P.E. (OR R.A.)

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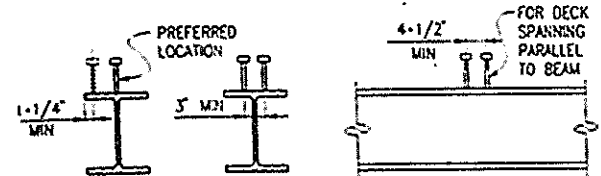
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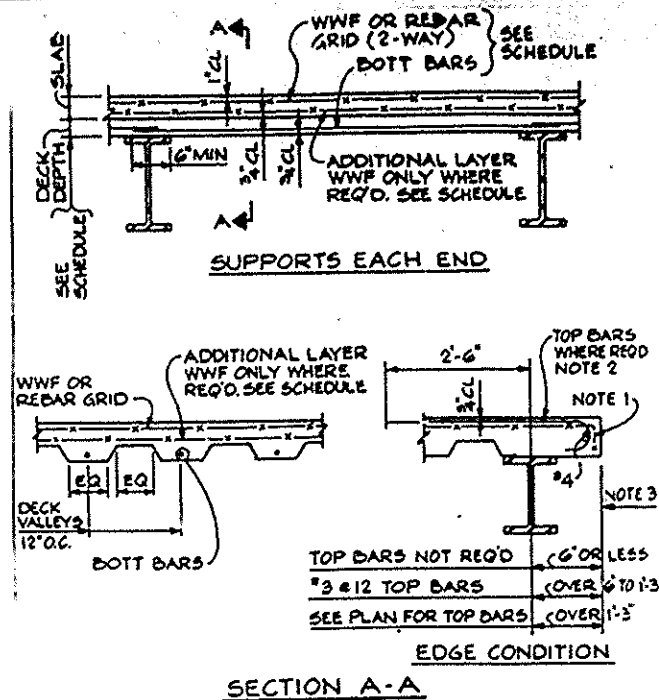
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N SLAB/DECK

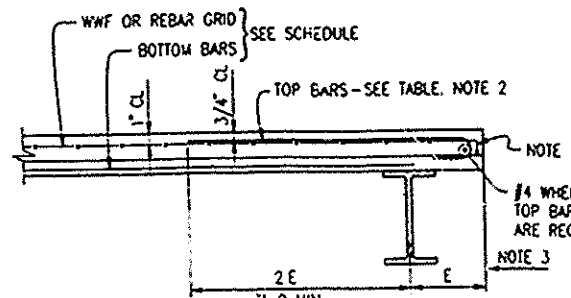
- WHERE DECK SPANS PERPENDICULAR TO BEAMS, THE SHEAR CONNECTORS SHALL BE PLACED IN VALLEYS WITH A MAXIMUM OF 2 SHEAR CONNECTORS PER VALLEY, UNLESS OTHERWISE NOTED. SHEAR CONNECTORS SHALL BE KEPT CLEAR OF DECK ENDS, SEAMS, AND EMBOSSEMENTS. SHEAR CONNECTORS SHALL NOT BE PLACED UNDER OR WITHIN 3' OF TRENCH HEADERS OR ELEVATORS SHEAVE BEAMS.
- WHERE A SINGLE NUMBER IS INDICATED [] IN PLAN, THE NUMBER OF SHEAR CONNECTORS SHALL BE DISTRIBUTED UNIFORMLY ALONG THE LENGTH OF THE BEAM, UNLESS OTHERWISE NOTED.
- WHERE A SINGLE NUMBER IS INDICATED [] IN PLAN AND THE EXTENT IS DESIGNATED BY ARROWS, THE NUMBER OF SHEAR CONNECTORS SHALL BE DISTRIBUTED UNIFORMLY ALONG THE DESIGNATED LENGTH.
- WHERE [MIN] IS INDICATED IN PLAN, PROVIDE SHEAR CONNECTORS AT 24" O.C.
- UNIFORM SPACING ON BEAMS WITH DECK SPANNING PERPENDICULAR SHALL BE ACHIEVED AS FOLLOWS:
 - WHERE THE NUMBER OF SHEAR CONNECTORS IS LESS THAN THE NUMBER OF VALLEYS, INTERMIX 12" AND 24" SPACING.
 - WHERE THE NUMBER OF SHEAR CONNECTORS IS GREATER THAN THE NUMBER OF VALLEYS, INTERMIX ONE SHEAR CONNECTOR PER VALLEY WITH TWO SHEAR CONNECTORS PER VALLEY APPLICATION WITH A MAXIMUM SPACING OF 12" O.C.



P STUD SHEAR CONNECTORS

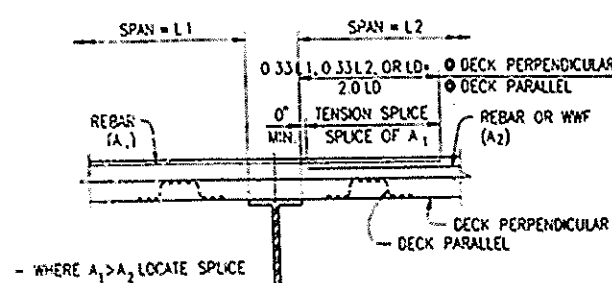


A-A

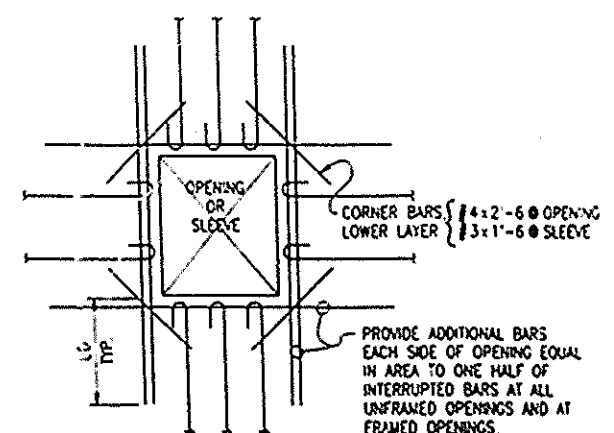


K SLAB/DECK

- NOTES:
- BEND OVER WWF FOR REBAR GRID PROVIDE STANDARD HOOK.
 - WHERE GRID REBARS ARE EQUAL TO OR GREATER IN AREA PER FOOT THAN REQUIRED TOP BARS, TOP BARS MAY BE OMITTED.
 - FOR LOCATION SEE PLAN. IF NOT NOTED IN PLAN OR SECTION, EDGE OF SLAB IS FLUSH WITH EDGE OF FLANGE.

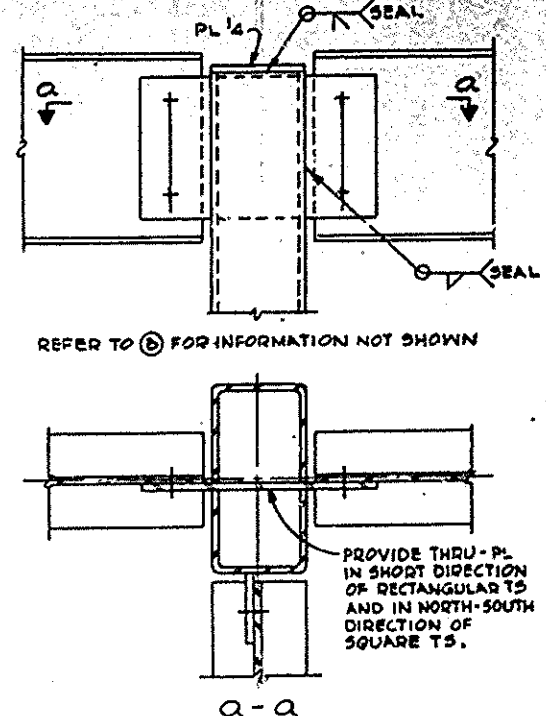


L SLAB/DECK



M SLAB/DECK

M SLAB/DECK



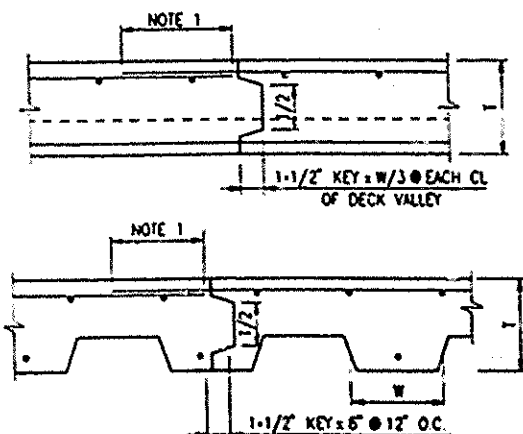
F CONNECTION OF BEAM TO T COLUMN

- For extent of slab/deck type, see plans and details. For description of slab/deck type, see schedule and details.
- For spans with supports at both ends, provide deck proportioned compositely to maintain the superimposed load indicated in schedule, except that, for spans including trench headers, provide deck proportioned non-compositely. Provide deck proportioned also to satisfy the following criteria for function as a form:
 - Dead load deflection limited to 1/180 of span or .75 in., whichever is smaller.
 - Steel stress limited to not more than 26700 psi for dead load plus 200 lb. concentrated load at midspan or, steel stress limited to not more than 20000 psi for dead load plus 20 psi additional load, whichever is more severe.
- For deck supporting cantilevers, provide deck proportioned to satisfy the following criteria for function as a form:
 - Dead load deflection limited to 1/90 of overhang or .375 in., whichever is smaller.
 - Steel stress limited to not more than 26700 psi for dead load plus 200 lb. concentrated load at outside end of overhang or, steel stress limited to not more than 20000 psi for dead load plus 20 psi additional load, whichever is more severe.
- 1W indicates normal weight aggregate concrete. 1L indicates lightweight aggregate concrete.
- Provide additional concrete as required to compensate for deflections of beams and of steel deck.

G SLAB/STEEL DECK

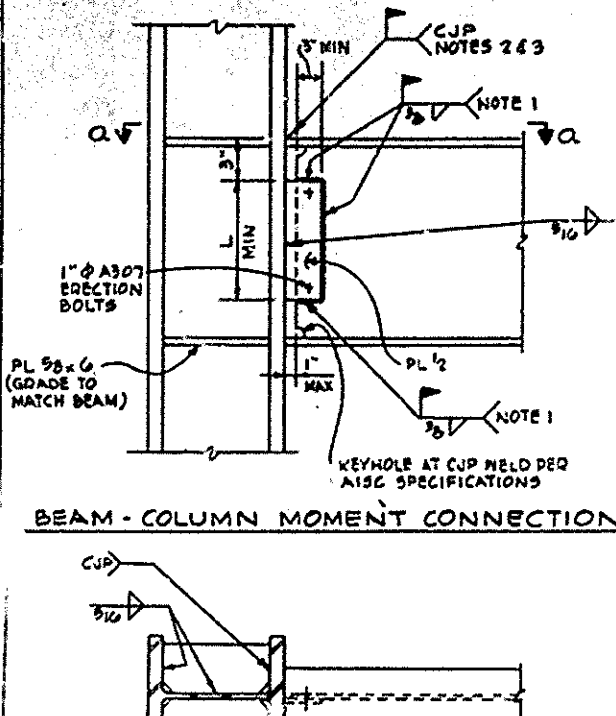
TYPE	DECK DEPTH (IN)	SLAB DEPTH (IN)	AGGREGATE	REINFORCING	REMARKS
D1	2	4	LW	3 #12 (N-S) 4 #12 (E-W)	BULKHEAD
D2	2	4 1/2	LW	6 #6 W2.0x2.0	FUEL OIL TANK ROOM DECK
D3	1 1/2	4	LW	4 #12 (N-S) 4 #12 (E-W)	W.C.

H SLAB/DECK



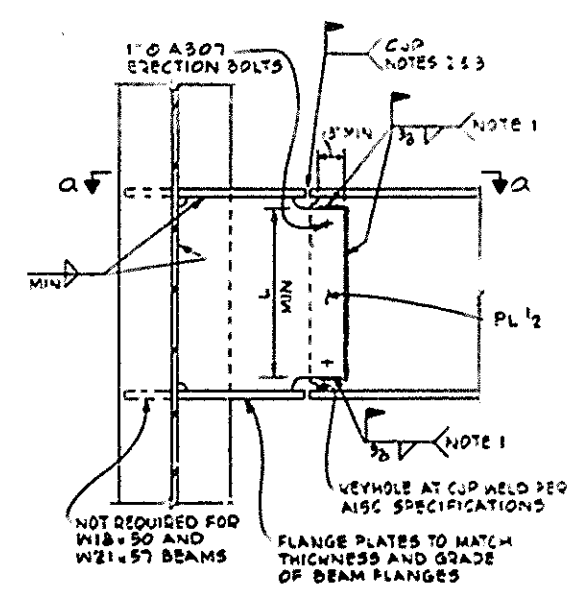
J SLAB/DECK

J SLAB/DECK

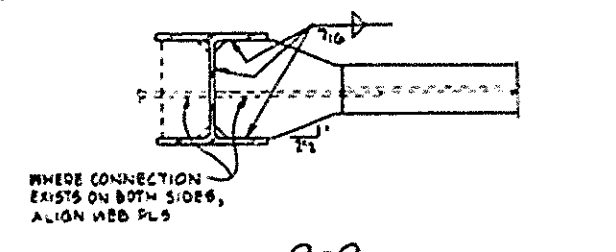


D CONNECTIONS

- NOTES:
- REFER TO TABLE FOR WELD LENGTH.
 - WELD BOTH SIDES, WHERE BACKING BAR IS USED REMOVE BAR, BACK GROUT, WELD FLUSH AND ADD A 1/4" REINFORCING FILLET WELD.
 - USE RUN-ON AND RUN-OFF TABS. REMOVE TABS AFTER WELDING AND FINISH TO SMOOTH CONTOURS PER 5.12.3 OF AWS D1.1-94.



E CONNECTIONS

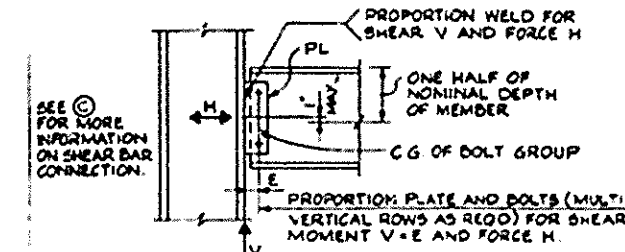


C CONNECTIONS

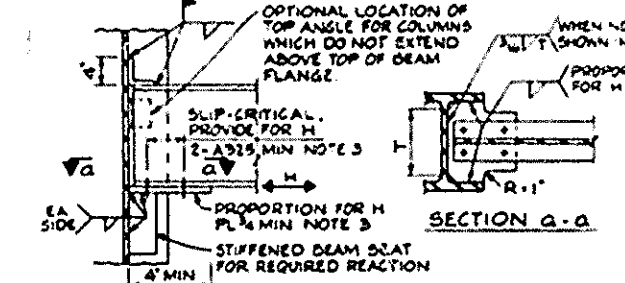
MATERIAL THICKNESS OF THICKER PART JOINED	MINIMUM WELD
3/4" AND LESS	1/4"
OVER 3/4" TO 1-1/2"	5/16"
OVER 1-1/2" TO 2-1/4"	3/8"
OVER 2-1/4" TO 6"	1/2"
OVER 6"	5/8"

- NOTES:
- UNLESS OTHERWISE NOTED IN THE STRUCTURAL DRAWINGS, WELDS SHALL BE OF THE SIZE NOT LESS THAN GIVEN IN THE SCHEDULE.
 - NOTATION IN THE DRAWINGS SHOWS "WELT" ASSOCIATION WITH THE APPROPRIATE FILLET OR PARTIAL PENETRATION WELD SYMBOL. FOR EXAMPLE:
 - MIN
 - MAX
 - THE MINIMUM WELD SIZE APPLIES TO THE LEG DIMENSION OF FILLET WELDS AND TO THE MAXIMUM EFFECTIVE THROAT OF PARTIAL PENETRATION GROOVE WELDS.
 - THE MINIMUM WELD SIZE NEED NOT EXCEED THE THICKNESS OF THE THINNER PART JOINED UNLESS A LARGER SIZE IS REQUIRED BY CALCULATED STRESS.

A WELDS



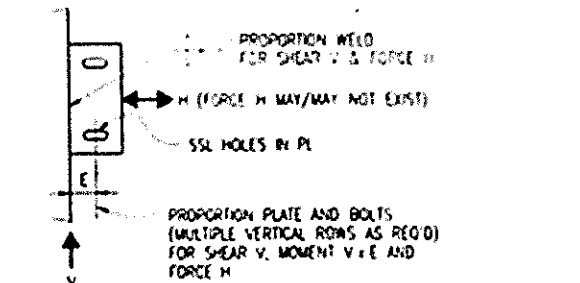
B CONNECTIONS



C CONNECTIONS

- NOTES:
- PROVIDE ADDITIONAL COLUMN WELDING AND/OR INTERNAL DIAPHRAGMS OR PLATES AS REQUIRED BY CONNECTION FORCES.
 - TOP FLANGE PLATES MAY BE USED AT THE CONTRACTOR'S OPTION IF TOP PLATES ARE USED, PROVIDE STEEL DECK SUPPORT PL 1/2 x 3/4.
 - MINIMUM REQUIREMENTS SHOWN ARE TO BE PROVIDED EVEN WHEN NO H IS INDICATED IN DRAWINGS.
 - WHERE NOTED THUS, "H" IN DRAWINGS, H IS TO BE TAKEN THROUGH THE TOP AND BOTTOM FLANGES OF THE BEAM.

B CONNECTIONS



D CONNECTIONS

D CONNECTIONS

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 STANDBY POWER
5 WORLD TRADE CENTER

STRUCTURAL

TYPICAL DETAILS

This drawing subject to conditions in contract and specifications. Views, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

 DESIGNED BY: JRL
DRAWN BY: JRL
CHECKED BY: JRL

 DATE: 11/11/97
SCALE:

 CONTRACT NUMBER: WTC-945.071
DRAWING NUMBER: ST-01

KEY PLAN